

REMARKS

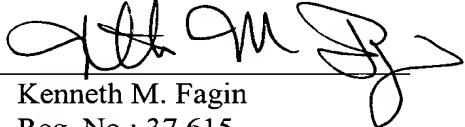
Minor editorial changes are being made to the specification and drawings to correct certain minor errors in the reference numerals. No new matter is being added.

Timely and favorable consideration on the merits is requested.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached Appendix is captioned "Version with markings to show changes made".

Respectfully submitted,

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Enclosure: Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Page 22, paragraph 0073:

[0073] Design and engineering of the desalination fractionation column will be determined in large measure based on the phase properties of the particular gas being used. Fig. 11 shows, for example, the carbon dioxide hydrate stability regions superimposed over the carbon dioxide phase diagram. The shaded portion of the diagram indicates that carbon dioxide hydrate (formed from carbon dioxide gas) is stable at from an upper pressure limit of about 18 atmospheres (1.824 MPa), just above 0° C, to about 40 atmospheres pressure (4.053 MPa) at just above about 8° C. With respect to carbon dioxide, per se, the liquidus extends from about 37 atmospheres pressure (3.749 MPa) at just above 0° C, to about 40 atmospheres pressure (4.053 MPa) at just above 8° C. Above the liquidus, carbon dioxide exists as a gas; below the liquidus, carbon dioxide spontaneously compresses to a liquid.

Page 24, paragraph 0077:

[0077] As in the case of positively buoyant hydrate-based embodiments, formation of the negatively buoyant (assisted buoyancy) hydrate is exothermic. Accordingly, according to the '422 application and precursors, heat which is given off during hydrate formation warms the surrounding, residual seawater, which makes the residual seawater more buoyant than the chilled seawater which is being input into the lower part of the column. The residual seawater therefore moves buoyantly upward along with the hydrate as new, denser input water is supplied to the base of the fractionation column, as at [360] 361.

Page 33, paragraph 00101:

[00101] In the embodiments of the '422 application described thus far, the weight of the column of water creates the pressures required for hydrate formation. In those embodiments, the minimum pressure depth at which hydrate is stable is far greater than at sea level, where the pressure is one atmosphere (0.10133 MPa). Accordingly, the hydrate begins to dissociate at relatively elevated pressures.

Page 60, paragraph 00169:

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2/29

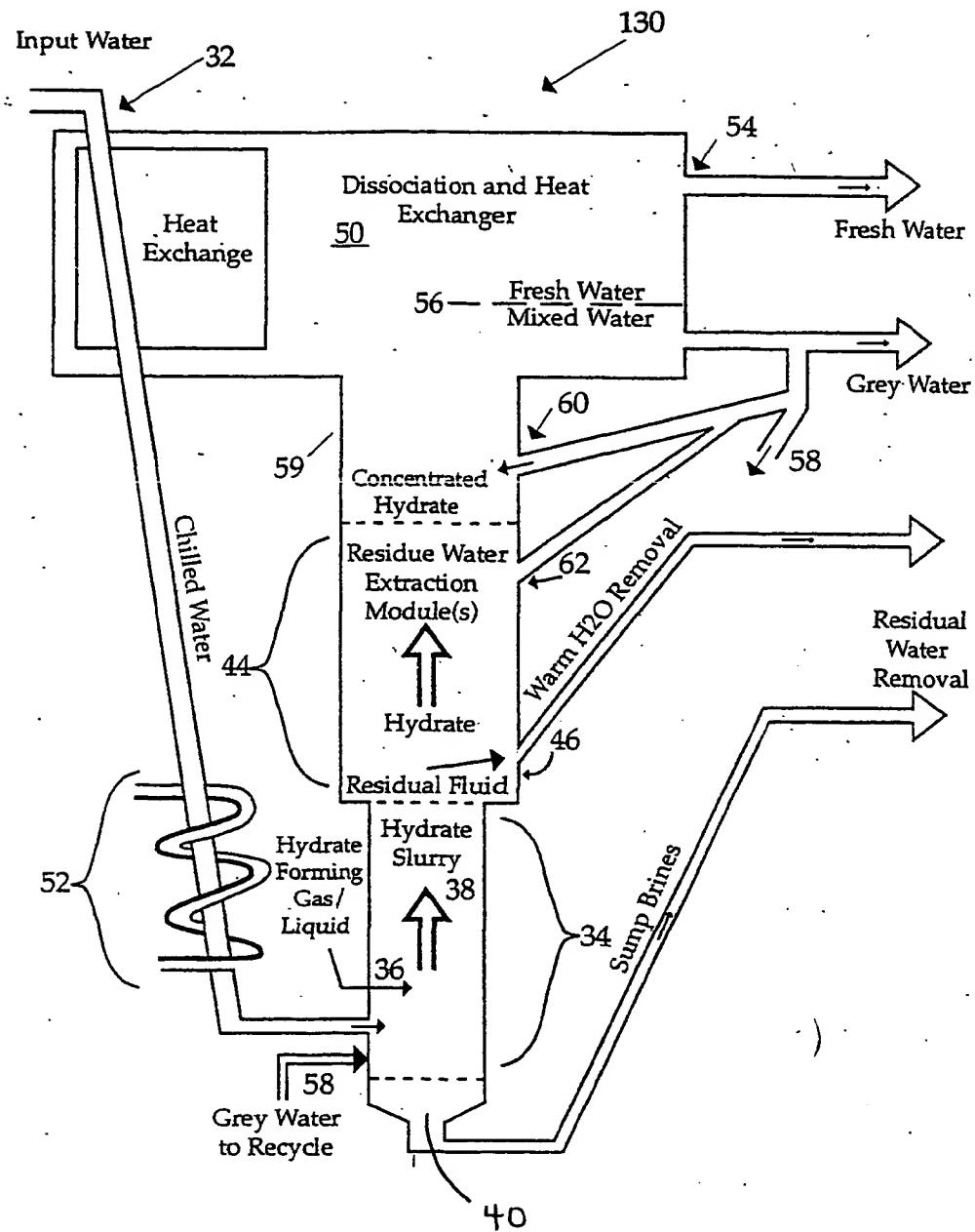


Figure 2

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8/29

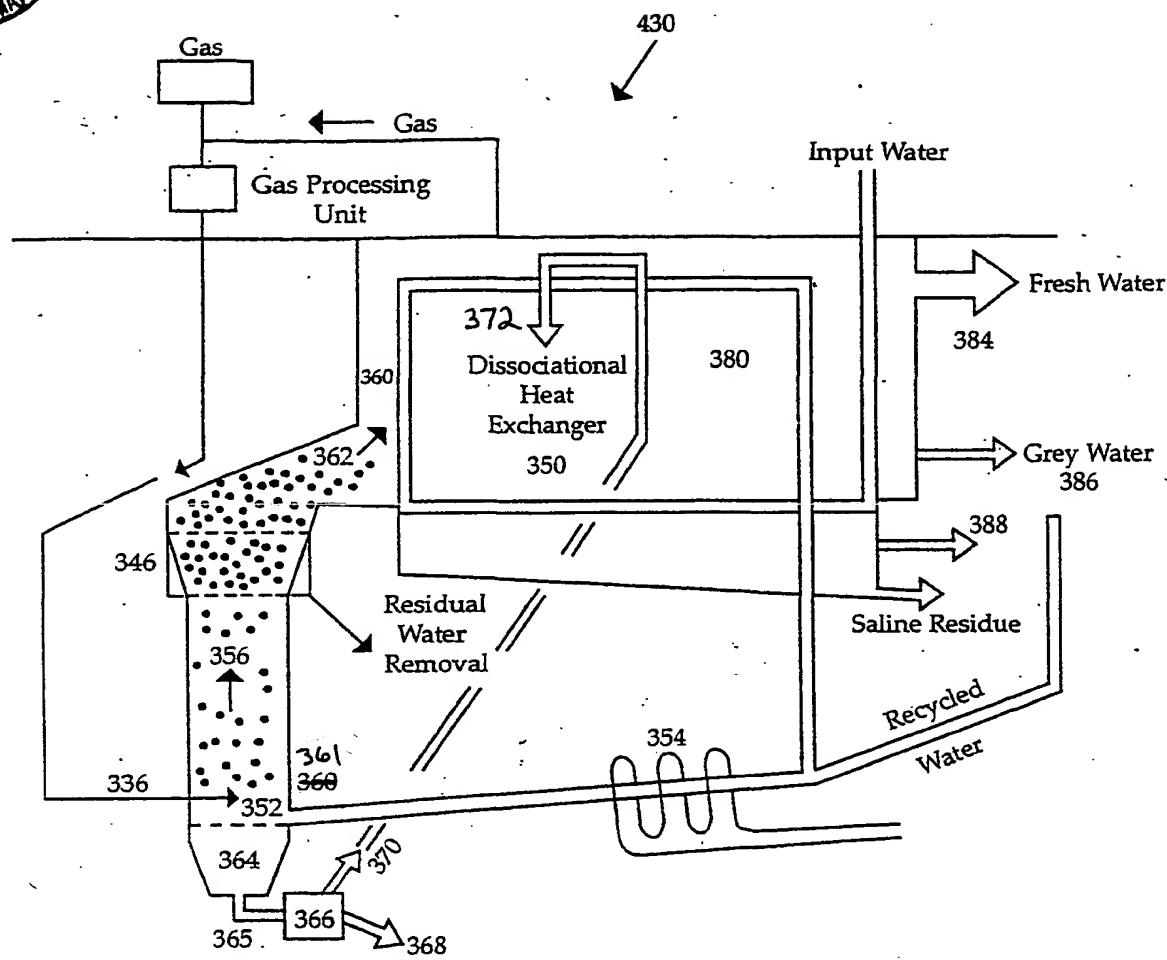


Figure 8



12/29

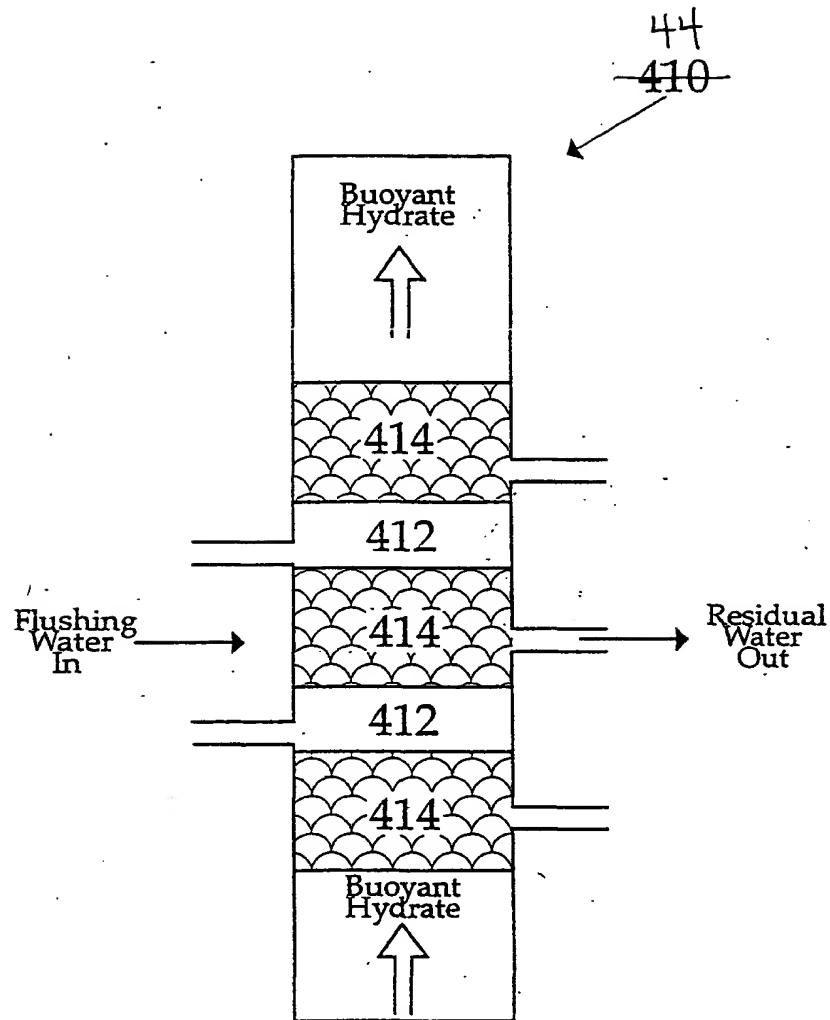


Figure 12

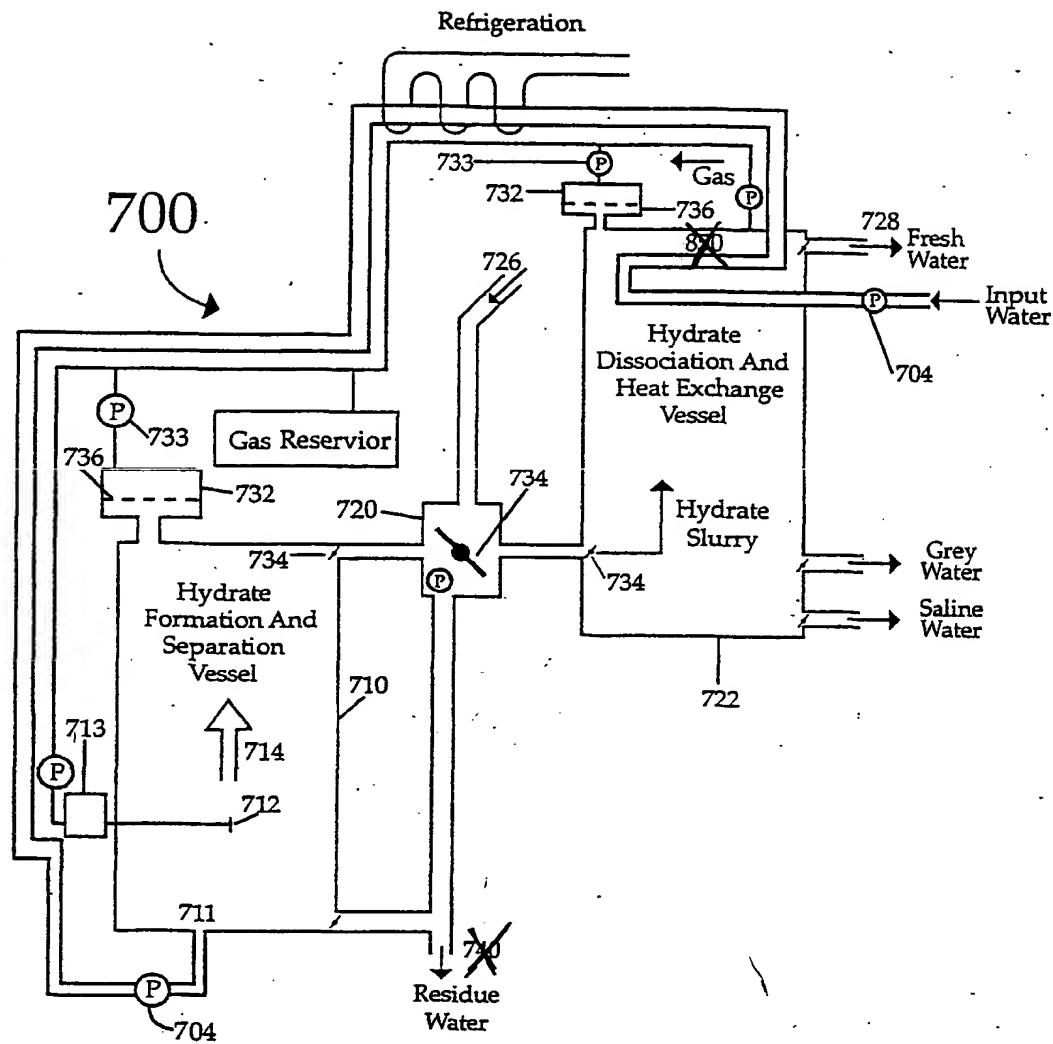


Figure 16



17/29

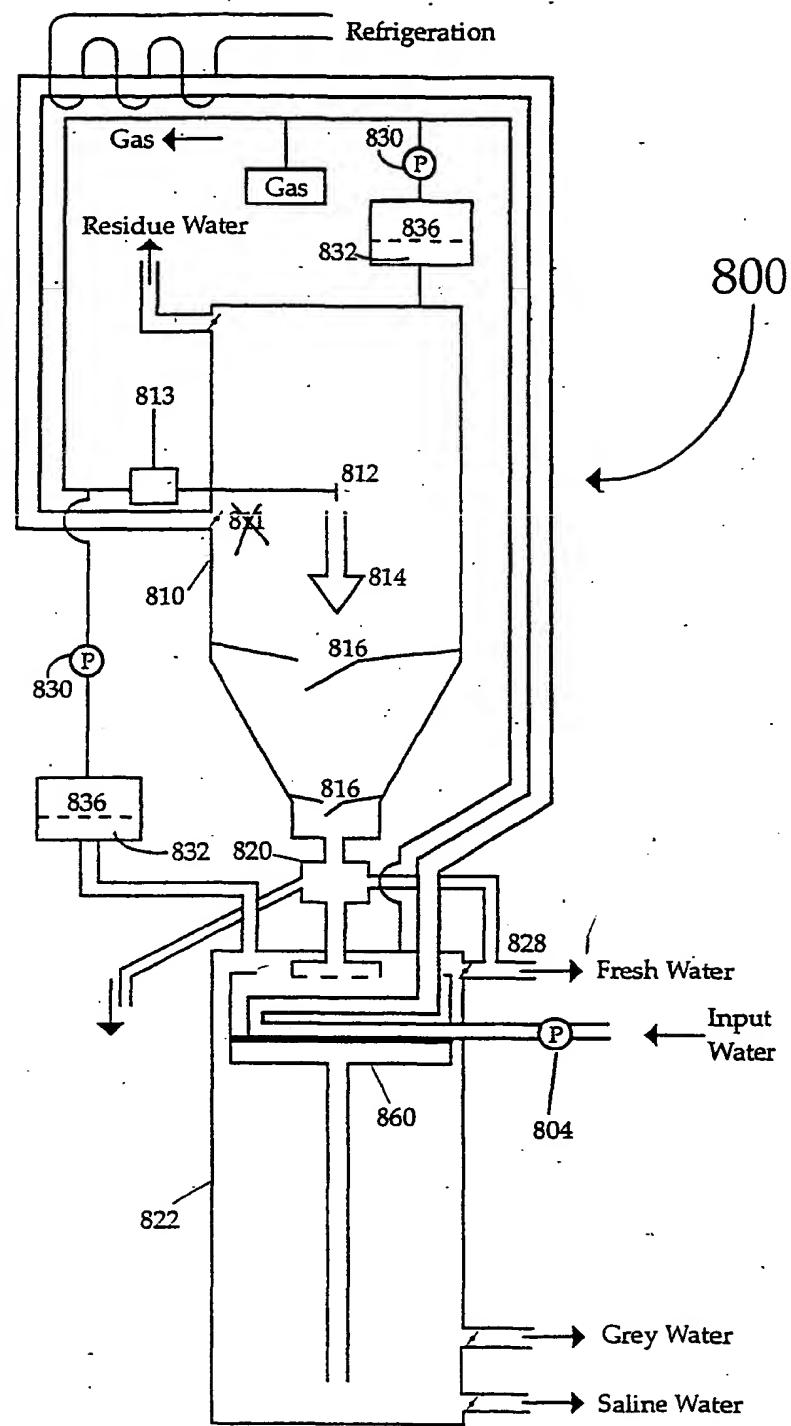


Figure 17

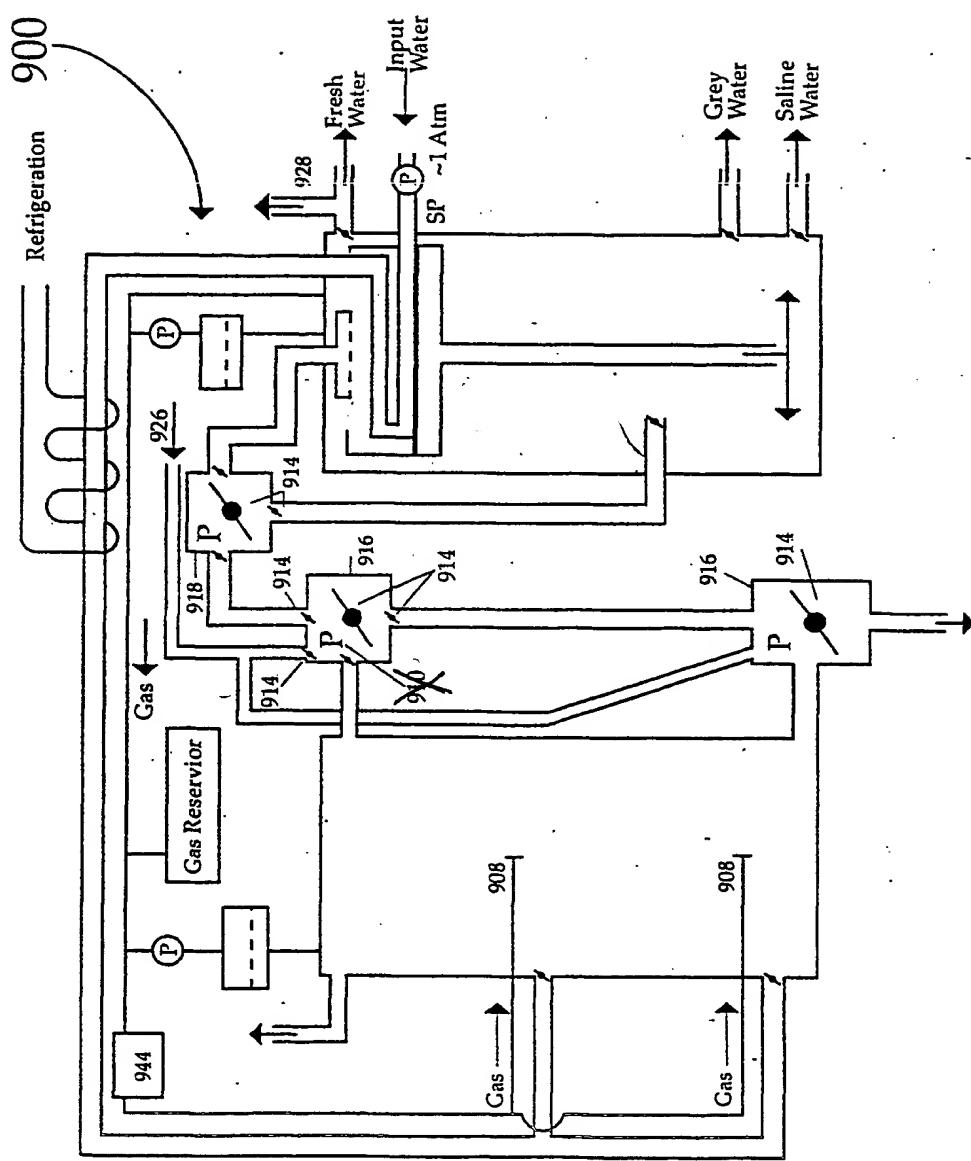


Figure 18

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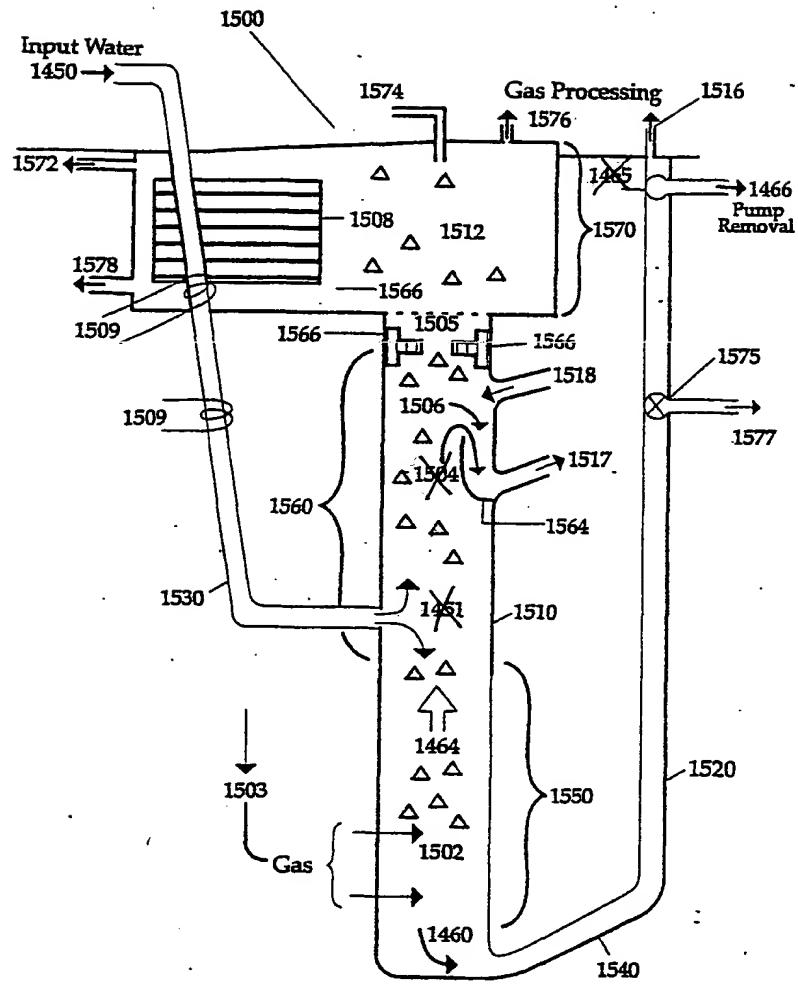


Figure 25

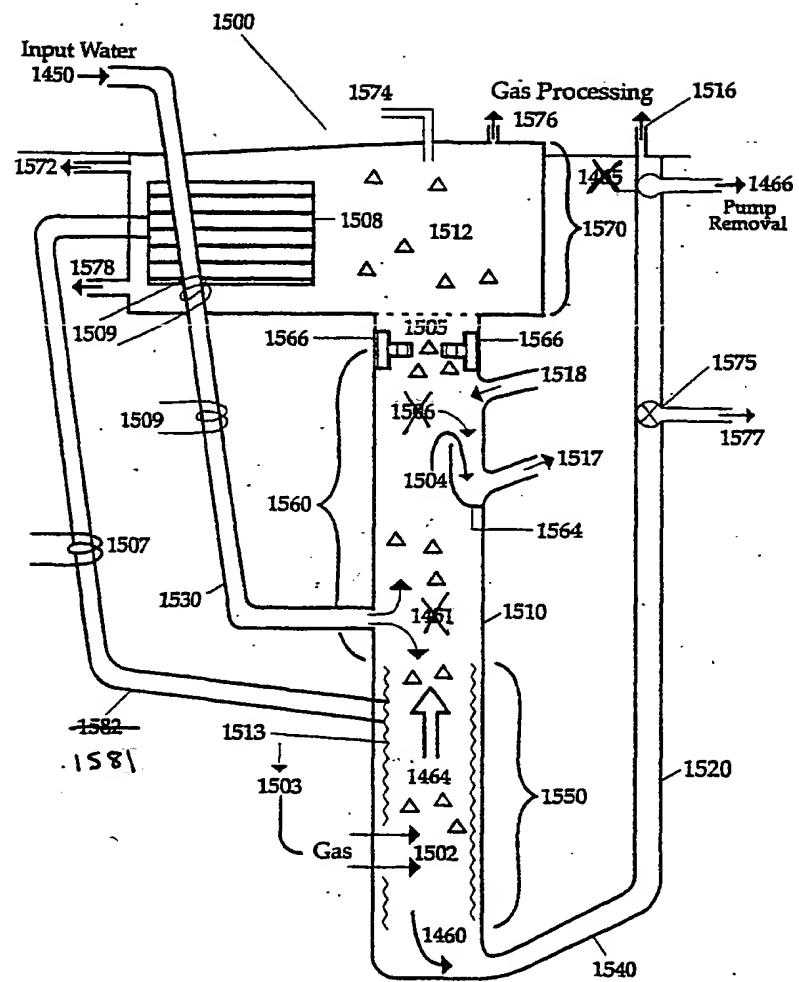
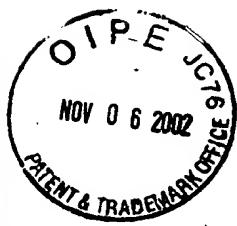


Figure 26

[00169] In another embodiment of the present invention, illustrated in Figure 26, artificial refrigeration is provided in the hydrate formation region so that a higher proportion of fresh water can be extracted from a given volume of water-to-be-treated by formation of hydrate than can be accomplished without artificial cooling. For example, as illustrated in Figure 26, artificial refrigeration elements 1513 are provided in the hydrate formation region 1550 of column [15210] 1510. The artificial refrigeration elements 1513 can include, for example, means for standard refrigeration techniques such as heat transfer from one region to another using another fluid in a closed system of pipes and radiators as the heat exchange medium. In another embodiment, direct cooling of the refrigeration apparatus in the hydrate formation section 1513 can be accomplished by thermoelectric techniques or other techniques, where some or all of the residual water [140] 1460 is used as the heat sink in or near the hydrate formation section. The effect of cooling the hydrate forming reaction results in the formation of more hydrate per unit volume of input water-to-be-treated than if the hydrate forming region were not artificially cooled. This enhanced formation of hydrate, which results in higher volume percentages of fresh water production, can be implemented in embodiments of both naturally and artificially pressurized apparatus.